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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,132	03/02/2004	Michael Hopkins	54593/297131	5392

23370 7590 07/14/2005

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EXAMINER	
DESTA, ELIAS	
ART UNIT	**PAPER NUMBER**
2857	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/791,132	HOPKINS ET AL.	
	Examiner	Art Unit	
	Elias Desta	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *3/2/2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/23/04, 3/2/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Drawing

1. The drawing is object to because of the following minor informalities:

- Fig. 1: Label the subsections as to function.
- Fig. 7: Provide a title or label.

Corrections are required.

Claim rejection – 35 U.S.C. § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. *Claims 1-12* are rejected under 35 U.S.C. 102(e) as anticipated by *Terry et al.* (U.S. Patent 6,772,633).

In reference to claim 1: *Terry et al.* teaches a method of fault detecting (acoustics-based diagnostic) in printing equipment (printer) having at least one sensor (see *Terry et al.*, Fig. 1, section 110) with at least one output indicative of the

present state of the equipment (see *Terry et al.*, Fig. 3, section 322). The method includes:

- Establishing sensor data that are representative of a state of the equipment under a fault condition where the fault condition generating a recordable failure signature (fault fingerprint) (see *Terry et al.*, Fig. 2, section 214 and column 3, lines 39-47), paragraph 13);
- Storing the data in a fault fingerprint library or signature database (see *Terry et al.*, Fig. 1, section 118 and Fig. 2, section 214);
- Determining the present state of the equipment (printer) using at least one sensor (see *Terry et al.*, Fig. 2, section 218); and
- Detecting the fault based on the comparison of the present state sensor data with at least one fault fingerprint in the fault fingerprint library (see *Terry et al.*, Fig. 2, section 220).

With regard to claim 2: *Terry et al.* does not teach the specific properties of the fingerprint (signature) for the machine, but the fault fingerprint is necessarily invariant across different manufacturing equipment built to the same nominal specification and running the same nominal process because given two identically the same equipment or printer having the same specification and operating condition of the fault fingerprint (signature), it is considered inherent to be invariant, and the same distinct error or fault condition across the same model of printers is established on the same premises.

With regard to claim 3: *Terry et al.* further teaches that the comparison is made between a set of vectors (sound fields) representing the deviation of sensor data from nominal values for the fault fingerprint or fault signature and the corresponding set of vectors or sound fields representing the deviation of sensor data from nominal values for the present state (see *Terry et al.*, column 4, lines 40-56).

With regard to claim 4: *Terry et al.* further teaches that the nominal values used for calculating the set of sound values or vectors for the present state are nominal values of the sensor data from the sensor of the equipment or printer (see *Terry et al.*, column 6, lines 4-44).

With regard to claim 5: see the explanation in claim 2 above.

With regard to claims 6 and 7: *Terry et al.* further teaches that the comparison is made by FFT between the sets of fault fingerprints and present state vectors or sound fields (see *Terry et al.*, column 4, lines 40-56 where an FFT is used to establish a relationship). FFT is used as a statistical method for matching, and correlation is carried out also in both spatial and Fourier domain. Hence, the analysis is just a design choice (see *Dew et al.*, page 1, for further discussion of correlation and Euclidean Distance in matching techniques).

With regard to claim 8: *Terry et al.* further teaches that the fault detection method includes predicting the impact of the fault on a particular process output (see *Terry et al.* Fig. 2, section 220).

With regard to claim 9: *Terry et al.* further teaches that the fault detection method includes a step for controlling at least one equipment input to compensate for the fault (see *Terry et al.*, column 3, lines 48-54).

With regard to claim 10: *Terry et al.* further teaches that the fault fingerprint is derived from a tool profile including a sound input versus system (sensor) response data (see *Terry et al.*, column 4, lines 40-46).

With regard to claim 11: *Terry et al.* does not teach about plasma chamber; however, the concept is equally applicable to any application. *Terry et al.* is applicable to a wide range of devices and machines with moving parts (see *Terry et al.*, column 1, lines 11-16).

With regard to claim 12: *Terry et al.* further teaches that the fault detection method includes a computer readable medium containing program instruction (see *Terry et al.*, Fig. 3, firmware 310) which, when executed by the data processing device, performs the method of steps claimed in claim 1 (see *Terry et al.*, Figs. 2 and 3).

Conclusion

4. Other prior art made of record:

- *Ison et al.* (Berkeley University, 'Fault Diagnosis of Plasma Etch Equipment') teaches a diagnostic performance of two probabilistic modeling techniques in using sensor signals to classify faults.

- *James et al.* (IEEE Article, 'Development of Computer-based Measurements and their Application to PD Pattern Analysis') teaches the method of characterizing partial discharge (PD) behavior using integrated quantities, statistical moments and other fingerprints for recognizing the PD pattern within the power frequency cycle.
- *Schaik et al.* (IEEE Article, 'Condition Based Maintenance on MV Cable Circuits as part of Asset Management; Philosophy, Diagnostic Methods, Experiences, Results and the Future') teaches condition-based maintenance on service aged power cable circuits.
- *Schwartz et al.* (U.S. PAP 2003/0042861) teaches a system and method for predicting mechanical failures in machinery driven by induction motor.
- *Duyar et al.* (U.S. Patent 6,393,373) teaches model-based fault detection system for electric motors.
- *Kilman et al.* (U.S. Patent 6,262,550) teaches electrical motor monitoring system and method.
- *Mikurak* (U.S. Patent 6,671,818) teaches problem isolation through translating and filtering events into a standard object format in a network based supply chain.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elias Desta whose telephone number is (571)-272-2214. The examiner can normally be reached on M-Thu (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)-272-2216. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-872-9306 for regular communications and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)-272-1750.

Elias Desta
Examiner
Art Unit 2857

-ed

June 20, 2005

HAL WACHSMAN
PRIMARY EXAMINER